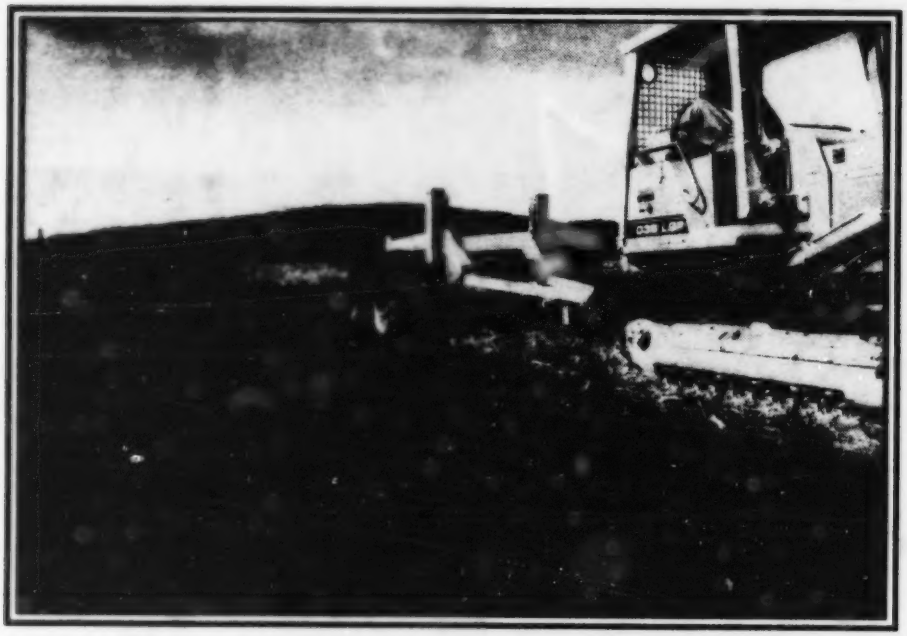
1989 D.A.T.E.



Demonstration of Agricultural Technology and Economics projects

BC Ministry of Agriculture and Fisheries
Hon. John Savage, Minister

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D.A.T.E. PROGRAM REPORT

Demonstration of Agricultural Technology and Economics

Submitted by:

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The Committee is appreciative of the work done by Helen Ropponen in the typing of this report.

Province of British Columbia Ministry of Agriculture and Fisheries
VICTORIA, B.C.
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TERMS OF REFERENCE

D.A.T.E. funds may be used for:

1. Evaluating and demonstrating known technological advances for enhancing the production, processing and marketing of agricultural products.

2. Supporting adaptive research projects aimed at solving priority problems confronting British Columbia agriculture.

3. Investigating production, processing and marketing systems to identify or substantiate the need for new technology.

4. Supporting mission-oriented trips with the objectives of: investigating innovative production, processing and marketing techniques for import or ultimate adoption in this province, and/or investigating export opportunities for British Columbia agriculture and fisheries technology.

5. Importing expertise to assist in introducing new technology or to advise on critical problem situations.

1989 - 90 DATE PROGRAM

The DATE (Demonstration of Agricultural Technology and Economics) Program provides funding for British Columbia Ministry of Agriculture and Fisheries staff supervised projects.

Twenty-two new and ongoing projects were reported on during 1989-90. Included below are highlights from a few of the areas studied.

- An integrated pest management video on British Columbia's horticultural industry was produced. Entitled "Protecting Natures Balance" it provided on excellent opportunity for the B.C. horticulture industry to promote the advancements that have been undertaken in crop management and to explain the benefits these provide to the general public and to the farming community. It was broadcast on the Knowledge Network.

- Work was carried out on the development of a Raspberry Cane Topping Machine. The prototype that was developed produced the clean cuts that are required and also propelled the cuttings into the area between the rows where they can be easily picked up. The development of this technology will be of real benefit to the Fraser Valley's raspberry producers.

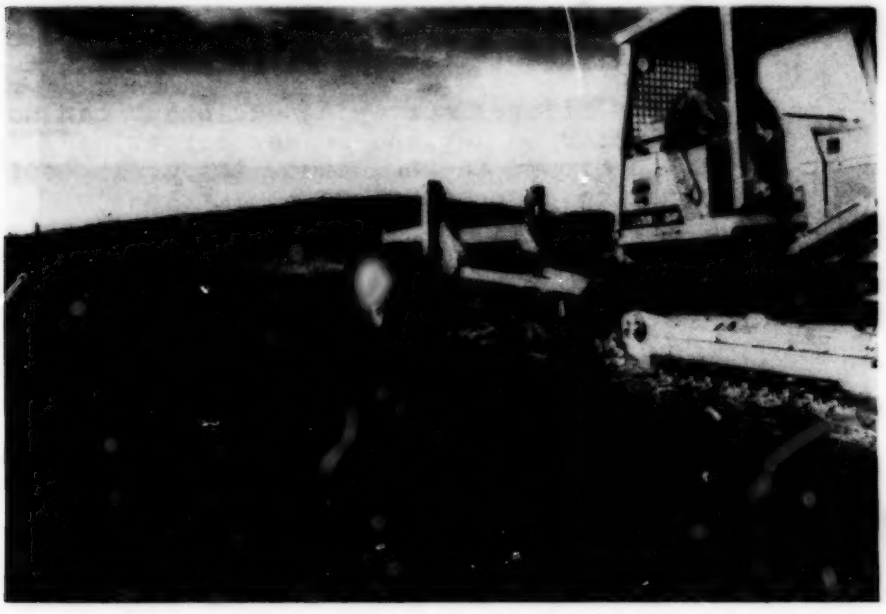
- The production of native Christmas trees has been carried out over many years in British Columbia. A native Christmas tree project is responsible for a renewed enthusiasm for this industry. It accounts for a significant increase in fertilizer, in understanding of proper pruning and thinning and in the grower's understanding of pests and their control.

- The "Improved Marketability of B.C. Produced Horses" project moved into its second year. It is designed to assist the horse breeding industry in developing a recognized horse evaluation program. The program enables the industry to identify superior animals while enhancing the marketability of B.C. produced horses.

- There was a very effective demonstration of the equipment necessary to effectively survey organic wetlands. Nine hundred and twenty three acres were surveyed. Ranchers were able to quickly receive plans indicating the meadow acreage.

The DATE Program Committee would like to acknowledge the cooperation of the project supervisors in the implementation of the 1989-90 DATE Program. It continues to be a very valuable vehicle for demonstrating new technology.

DEMONSTRATION OF EQUIPMENT FOR DEVELOPING ORGANIC WETLANDS



Organic wetland plow capable of efficiently turning the sod for reseeding

Project Number: 93

Supervision: Ted Van der Gulik - Senior Engineer, Abbotsford
Bert van Dalfsen - Mechanization Engineer, Abbotsford
Russell Merz - Water Management Engineer, Abbotsford

Co-operators: Peter Elson - Surveyor, Summer Assistant

Branch: Soils and Engineering

Funding:

D.A.T.E. 1981-82	$9,800
D.A.T.E. 1982-83	$4,800
D.A.T.E. 1983-84	$5,500
D.A.T.E. 1984-85	$8,350
D.A.T.E. 1985-86	$7,350
D.A.T.E. 1988-89	$9,000

Objective: To develop and demonstrate the special equipment and methods required to optimize forage production on organic wetlands in the B.C. interior.

Summary:

The equipment and techniques for organic wetland meadow development have been tested and are available for implementation, however, before a meadow can be developed, a water management plan outlining drainage and irrigation requirements must be prepared.

Conventional surveying equipment can not be used in wetland meadow situations. The ground in the meadow is usually soft, making accurate surveys next to impossible. The branch tested a total station survey unit (D.A.T.E. Project No. 157) to try and find alternate methods of surveying wetland meadows. A total station allowed all measurements to be taken with the instrument on solid footing from a minimum number of instrument stations.

The instrument also allowed the survey to sight from a high vantage point over-looking the meadow. This allowed surveys to be carried out without brush clearing. The total station unit also integrated the branches CAD machine to simplify and speed the date reduction and plan preparation process.

A total of 923 acres were surveyed under D.A.T.E. Project No. 93 during the past year. The program proved very effective with ranchers quickly receiving plans indicating the acreage of the meadow. These plans were used in determining constructual obligations with the contract operating the plow. Drainage design plans are currently being prepared for meadows that will require plowing during the 1990 season.

The Soils and Engineering Branch will continue to serve as the lead agency for wetland meadow development work for the next few years. A total station unit will hopefully be purchased to allow the branch to schedule work more effectively and to ensure continuation of this program.

INTENSIVE APPLE PLANTING DEMONSTRATION PROJECT

Project Sign - In Background Apples in Full Bloom

Project Number: 200

Supervision: M. Sanders, Provincial Tree Fruit Specialist, Kelowna; Dr. H. Quamme, Pomologist, Agriculture Canada, Summerland; N. Filipenko, Naramata Co-operative, Naramata.

Co-operator: Ted Ritchie, Orchardist, Naramata

Branches: Development and Extension, Southern Interior Region; Farm Management.

Funding: Joint - D.A.T.E./New Crop Development Fund/Ted Ritchie - approximately $20,000. over 5 years.

Objectives: To demonstrate four apple training systems in a commercial orchard using McIntosh. The systems chosen are U.S.D.A. Central Leader, Van Roechoudt Trellis, Central Axe and Slender Spindle. Rootstocks are M9 and M26.

An annual economic analysis will be prepared showing costs and returns for each combination trial.

Summary:

Trees were planted in the spring of 1987. The overall tree quality was generally poor but growth in the orchard has been good. Because of the poor quality trees that were planted, only small crops were harvested in 1988. Cropping was considerably better in 1989. The following are the 1989 per acre yields:

Slender Spindle - 5600 pounds;
Central Ax - 4000 pounds;
Van Roechoudt Trellis - 3600 pounds;
Central leader - 2800 pounds.

Quality was good for all systems.

There were two major tours of the project in 1989.

The following is the co-operator's summary of what has been learned to date:

- Cultural labor costs were not as high in the third year as they were in the first two years as less tree training was required in the third year;

- Tree row volume spraying is very effective;

- High density plantings attract harvest labour;

- Production to date is directly related to tree density.

ASIAN PEAR VARIETY TRIAL - 1989

Project Number: **206**

Supervision: Brent Warner, New Crop Development Specialist, Sidney

Co-operators: Agriculture Canada Plant Quarantine Station, Sidney

Branch: Development and Extension, South Coastal Region

Funding: D.A.T.E. 1989-90 $1,500

Objectives:

1) To test high density trellis systems that have been developed in New Zealand for application to Asian Pear production on the coast.

2) To test yields and variety suitability of the major Asian Pear varieties currently grown worldwide.

3) To study two different root stocks, Quince and Pyrus betulaefolia and the affect on fruit numbers and quality under local conditions.

Summary:

Virus-free budwood was obtained and plants of eight varieties were propagated.

Posts and wire will be installed in early 1990 prior to spring planting of the trees. Yields and quality assessments will take place over the next four to five years.

IMPROVEMENT OF NATIVE STAND CHRISTMAS TREE PRODUCTION

The quality possible from East Kootenay Native Stands using methods demonstrated

Project Number: 236

Supervision: Richard Hallman, District Horticulturist, Creston, B.C.

Co-operators: Kootenay Christmas Tree Association,
George Geldart, Regional Economist, Vernon, B.C.
Mike Malmberg, District Agriculturist, Cranbrook, B.C.
Carol Barnett, Provincial Nursery Specialist, Abbotsford, B.C.

Funding: D.A.T.E. 1987-88 - $ 6,885
D.A.T.E. 1988-89 - $11,500
D.A.T.E. 1989-90 - $ 500

Objectives: 1) To demonstrate methods to improve the rate of growth, stocking rates and quality of native grown Douglas-fir Christmas trees.

2) To develop a production cost model to evaluate the profitability and financial implications of cultural practices of native grown Christmas trees.

3) To demonstrate labour saving equipment suitable to native stand Christmas tree culture.

4) To make Christmas tree growers aware of the diseases and insects affecting their trees and what can be done about them.

5) To develop audio-visual teaching aids for use in extension programs on native Christmas tree production throughout the province.

Summary: The production of native stand Christmas trees is an important industry in the East Kootenay area. The industry has been reacting to market problems and changing consumer preferences by producing fewer and fewer trees over the last 25 years. Through the activity of this project, and the Kootenay Christmas Tree Association, it is hoped that the production decline will cease and that returns to growers will improve.

During the three years of this project numerous demonstration plots, field days, demonstrations, and educational meetings were organized throughout the East Kootenay area. During 1989-90 these activities were extended and final fieldays were held to view the response from fertilization during 1987.

This project has been responsible for a significant increase in fertilizer used; in growers understanding of proper pruning and thinning of native stands; and in growers understanding of pests and costs associated with the production of Native Stand Christmas trees.

This project has demonstrated available Agricultural Technology and Economics of Native Stand Christmas tree culture and has been responsible for renewed enthusiasm and a positive outlook for the future of this industry.

TESTING OF BACTERIAL KIDNEY DISEASE VACCINE FOR FARMED SALMON

Joan McKay inspects petri dishes for disease identification

Project Number: 260

Supervision: Dr. Allan J. Castledine, Provincial Aquaculture Production Specialist, Victoria, B.C.

Co-operators: Ms. Joan McKay, United Hatcheries Ltd., Halfmoon Bay, B.C.
Aqua-Health, Charlottetown, Prince Edward Island

Branch: Aquaculture and Commercial Fisheries

Funding: D.A.T.E. 1989/90 - $3,000

Objective: To field-test a new vaccine for its efficacy in preventing bacterial kidney disease in farmed chinook salmon.

Summary:

Bacterial kidney disease (BKD) is the most serious threat to the success of salmon farming in British Columbia with losses of stock between 10% and 90% over the two year grow-out cycle. It is a chronic bacterial infection which causes the heaviest mortality in the second year of growth.

Any in-roads in preventing the disease will improve the economics of salmon farming. Development of effective vaccines has been slow because of the nature of the bacterium and the difficulty in culturing large quantities for vaccine production. Crude vaccines tested to date have had low effectiveness. However, even minor improvements can have a major effect on profitability. Reduction in losses by 5% would be considered successful in this study.

Protocol: Fifty thousand, 8 gram chinook smolts were obtained from Rosewall United Hatcheries. Twenty-five thousand were used as a control group which received an injection of 0.5ml of a bivalent vaccine for vibriosis and furunculosis. The test group, also 25,000 fish, were administered 0.5ml of a trivalent vaccine for vibriosis, furunculosis and bacterial kidney disease. The smolts remained in fresh water for four weeks prior to introduction to salt water where the two groups are being held under identical conditions. The fish will be held over a two year period and monitored for losses to BKD and other infectious agents.

Current Observations: After four weeks in fresh water, the test group had increased in size to an average of 10.9 grams as compared to 14.6 grams for the control group. The test group showed higher antibody titres to the causative organism, Renibacterium salmoninarum than the control group. Both test and control groups had clinical BKD positives.

Total mortalities from August 8, 1988 until September 2, 1989, were 20.8% for the control compared to 14.1% for the test group. Mortalities included transport losses, BKD, algae blooms, vibriosis, heart deformities and miscellaneous other losses. The fish were treated with therapeutants as required during this period.

At this time, the vaccine appears to be responsible for a 7% increase in survival in the test group. A full evaluation will be made at harvest as will an assessment of the initial setback in growth apparently caused in the test group due to vaccination. These preliminary results will have to be confirmed by further trials. In addition, vaccine application methods will have to be refined to improve cost-effectiveness. The cooperators propose undertaking further research including investigations of attenuated live vaccines.

INTEGRATED PEST MANAGEMENT (IPM) OF COLE CROPS

Diamondback larva damage on Brussel sprouts. This type of injury, even at a very low level, can result in rejection of an entire shipment.

Project Number: **263**

Supervision: Mark Sweeney, Vegetable Specialist, Abbotsford;
Henry Gerber, Entomologist, Cloverdale

Co-operators: Ward Strong, Coast Agri
Helene Contant, Project Contract
Dr. Bob Vernon, Research Entomologist, Agriculture Canada
John Quapp, Fieldman, Empress Foods, Ltd.
Fraser Valley cole crop growers

Branches: Development and Extension, South Coastal Region; Crop Protection Branch

Funding:

D.A.T.E. 1988-89	$6,500
Fraser Valley Cole Crop Growers' Assoc.	$1,000
D.A.T.E. 1989-90	$6,000
Fraser Valley Cole Crop Growers' Assoc.	$2,000

Objective:

In an Integrated Pest Management (IPM) program, crops are monitored throughout the growing season and pesticides are only applied when pests are present at levels that can cause economic damage or unacceptable losses. The objective of this project was to obtain the information necessary to develop an IPM program for cole crops.

Summary:

Cole crop production in B.C. is valued at $10 m (farm gate). Insect pest control represents a significant percentage of production costs. Even so, losses due to insect damage and contamination are high, particularly on crops shipped to processors.

In 1988 and 1989, nine co-operating Brussel Sprouts growers were chosen. Starting in June, fields were inspected weekly and counts taken of pests and potential parasites/predators.

The following summarizes what has been learned to date:
Growers who based their spray program on detected pest levels harvested crops generally free from insect damage and contamination.

There were large differences between fields in the type and number of pests present. Monitoring must be field specific. In some fields, particularly in 1988, insect levels remained very low and growers were able to eliminate some sprays and still produce a marketable crop.

The types of pests present and the severity of infestation were considerably different in 1989 as compared to 1988. In 1988, cabbage aphid was the main concern. In 1989, warm weather in September caused a build up of green peach aphids and diamondback moth larvae, both of which are difficult to control pests. Weekly monitoring provided hard information on the number and type of each pest in each field allowing a field-specific spray program to be developed.

For a long season crop such as Brussel Sprouts, fairly high insect populations and associated damage can be tolerated early in the season prior to the formation of the edible portions of the plant.

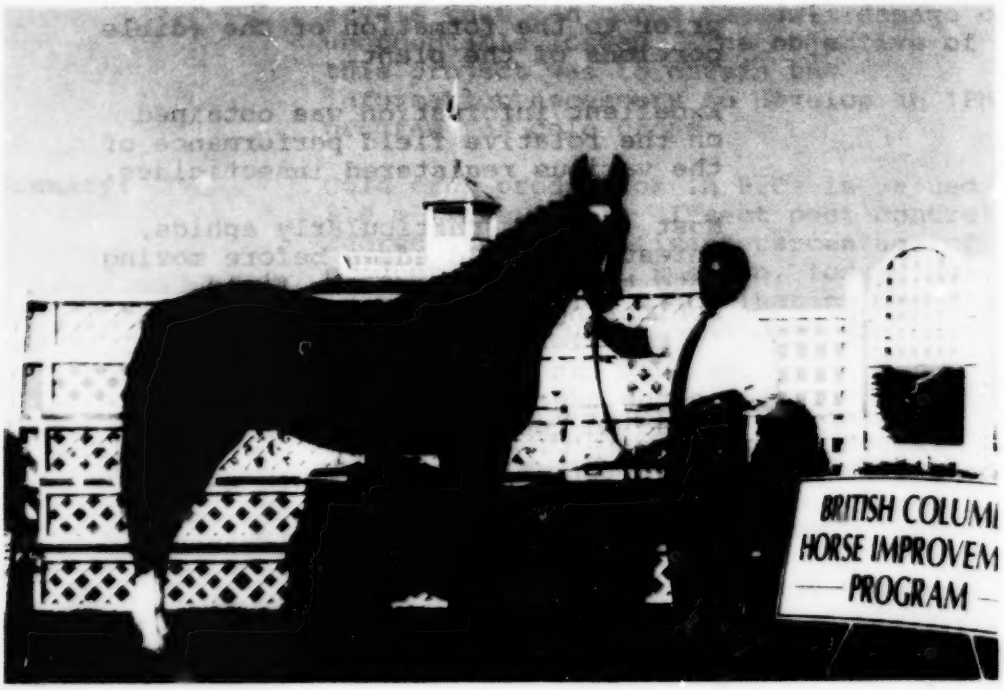
Excellent information was obtained on the relative field performance of the various registered insecticides.

Most insects, particularly aphids, infest the field edges before moving into the interior of the field. Monitoring can sometimes be limited to the field edges. In some cases, a pest can be controlled by spraying on the edges thereby greatly reducing the cost.

Analysis of Brussel Sprouts samples from monitored fields showed crops to be well under legal tolerances for pesticide residues.

Further analysis of the data is ongoing. To conclude the project, guidelines will be prepared for the operation of a cole crop IPM program and released to the industry. The program is expected to be offered as an IPM service by a private pest control consultant in 1990. The net result should be lower crop losses due to insects, a higher quality product and higher net returns to growers.

IMPROVED MARKETABILITY OF B.C. PRODUCED HORSES



Platinum Award Winner "Fitzpatrick" Dutch Warmblood

Project Number: 267

Supervision: Mark Robbins, Horse Industry Development Specialist, Cloverdale

Co-operators: Horse Council of B.C., Horse Industry Division
Various Breed Representatives

Branch: Specialized Programs

Funding:

D.A.T.E. 1988-89	$15,000
D.A.T.E. 1989-90	$10,000
D.A.T.E. 1990-91	$10,000

Objectives: To assist the horse breeding industry over a three year period in developing a recognized horse evaluation program (the B.C. Horse Improvement Program).

The program enables the industry to identify superior animals while enhancing the marketability of B.C. produced animals. The major criteria for selection of superior animals within each breed is form (conformation) as related to function (performance) with emphasis placed on the athletic ability of the horse.

Summary:

The B.C. Horse Improvement Program was held at Milner Downs, Langley B.C. September 23 - 24, 1989. A total of 171 horses representing 22 breed divisions were evaluated by a panel of three judges. A total of 9 platinum seals (90 - 100%), 107 gold seals (80 - 89%), 65 silver seals (70 - 79%), and 17 bronze seals (60 - 69%) were awarded in halter and performance divisions. Results were distributed and top ranking horses within each breed will be used to promote the breed, the horse, and the breeder and owner, in various equine publications.

Major accomplishments for the 1988/89 year included the expansion of the Welsh classes to reflect the four divisions of the registry, and the inclusion of Dutch Warmblood, Hanoverian, Oldenburg, Trakehner and Westphalian under the popular European Warmblood Division. There was also a return to the two-day judging format used at the outset of the program in Armstrong.

The 1989 entries represent a 21% increase over the previous year, and an 188% increase over 1987 numbers indicating the growing acceptance of the B.C. Horse Improvement Program.

ALTERNATIVE HERBICIDES FOR VEGETABLES AND BERRIES

Project Staff Studying Weed Complex in Beans

Project Number: **271**

Supervision: Roy Cranston, Provincial Weed Specialist, Cloverdale.

Project Staff: Dr. Jack Freeman, Agassiz Research Station (retired).

Branch: Crop Protection.

Funding: D.A.T.E. 1988/89 - $10,000
D.A.T.E. 1989/90 - $10,000

Objectives: The formulation, sale and distribution of dinoseb products was suspended in 1986 due to concerns regarding carcinogenic developmental toxicity. This project is intended to develop, seek registration for (full or minor use) and demonstrate alternatives to dinoseb herbicide in fresh market and processing peas, beans, cucurbits, potatoes and for raspberry shoot removal. Development work for weed control in blueberries was also undertaken. Development, demonstration and adoption of alternatives will serve to lessen the already significant competitive advantage of imported crops.

Summary: Several trials were conducted over the past two years in search of a dinoseb substitute. Herbicides were tested alone and in mixtures in order to broaden the weed control spectrum and potentially reduce herbicide use rates. This work has resulted in eleven treatments being submitted to Ottawa for Minor Use Registration for five B.C. crops. Indications are that many of these will be approved uses for the 1990 crop season.

Asparagus (seedlings and new plantings).

Napropamide (Devrinol). Preemergence to weeks and crop 4.5 to 9.0 kg/ha.

Asparagus (established).

Terbacil (Sinbar).
Most annual grasses and broadleaf weeds - applied preemergence.

Asparagus (established).

Napropamide + simazine (tank mix) at 4.5 - 6.7 a.i. kg. + 1.1 - 2.2 a.i. kg/ha. Preemergence to established beds.

Snap Beans

Metolachlor (Dual) at 1.7 - 2.2 a.i. kg/ha. Control annual broadleaf weeds.

Cole Crops

Napropamide (Devrinol) at 1.1 - 2.2 a.i. kg/ha preplant incorporated, preemergence surface to direct-seeded and transplants.

Processing peas

Metribuzin (Sencor) at 0.20 - 0./30 a.i. kg/ha postemergence to crops and weeds.

Highbush Blueberries (phytotoxicity trials conducted 1989).

Glyphosate (Roundup) at 1 to 2 a.i. kg/ha, directed spray.

Summary (Cont.)

Napropamide (Devrinol) at 4.5 a.i. kg/ha - apply in the fall through early spring prior to weed emergence. Control germinating annual broadleaf weeds and grasses.

Diuron (Karmex) at 1.8 a.i. kg/ha - apply prior to the germination and growth of annual weeds. Controls germinating annual broadleaf weeds and grasses.

Sethoxydim (Poast) at 0.15 - 0.80 a.i. kg/ha applied at 2 - 5 leaf stage of annual grasses or 1 - 3 leaf stage of quackgrass.

Fluazifop-P-butyl (Fusilade II) at 0.25 - 0.75 a.i. kg/ha applied at 2 - 6 leaf stage of annual grasses or 3 - 5 leaf stage of quackgrass.

Raspberry Primocane Suppression

Four treatments (paraquat + diquat, lactofen, Enquick, and Goal) have shown promise for replacing dinoseb for raspberry shoot removal. Further testing is required before they can be submitted for registration.

A total of 43 experiments were carried out over the duration of this project. Results for all crops are reported to the Expert Committee on Weeds (West) and form the basis for expanding herbicide label uses.

DEMONSTRATION OF AGRICULTURAL TECHNOLOGY IN THE SOUTH COASTAL REGION

Air Pollinator in use During Field Trials at Vantreight Farms, Victoria, B.C.

Project Number: 275

Supervision: Wayne Wickens, Regional Director, South Coastal Region

Co-operators:
Bill Weismiller, District Agriculturist, Chilliwack, B.C.
Environment Canada, Atmospheric Environment Service, Lower Mainland Weather Office, Vancouver, B.C.
Brent Warner, New Crop Development and Specialist, Sidney, B.C.
Vantreight Farms, Victoria, B.C.
New Zealand Ministry of Agriculture and Fisheries
Sylvan Vale Nursery Ltd., Black Creek, B.C.
Dr. Bob Martin, Agriculture Canada, Vancouver, B.C.
Dave Flood, Horticulture Technician, Agriculture and Food Centre, Abbotsford, B.C.
Bill Peters, Provincial Berry Specialist, Abbotsford, B.C.

Branch: Development and Extension, South Coastal Region

Funding: D.A.T.E. 1989-90 - $10,000

Objective: To enhance the adoption of new technologies in the South Coastal Region by demonstrating new techniques and by observing, collecting and disseminating relevant information found outside the region.

Summary: A New Zealand developed Airflow Pollinator for the artificial pollination of Kiwifruit was assessed as well as various carrier compounds for use in the actual application of pollen to the Kiwifruit flowers. The Airflow Pollinator was utilized in one field trial and in two green houses. It definitely improved fruit quality in the field trial and did set a crop under greenhouse conditions although fruit quality was dependent on the pollen carrier agent. Research is underway in New Zealand to determine which of the carrier agents will provide the most successful pollination utilizing both dry and liquid application technology.

In May of 1989, a farm weather service was initiated. The service equipment consists of a telephone line and an automatic telephone answering device. Designed to supplement existing broadcast weather forecasts, what makes the system work is the twice daily updates from Environment Canada, Lower Mainland Weather office. A thirty six hour forecast and three day outlook are available to interested farmers who call the Farm Weather Service number and listen to the one to three minute report. Farmers are provided with reliable, timely weather forecasts tailor-made for their farming needs. An average of 10 - 15 calls were made to the service daily with over 40 made during peak demand periods. The service will be re-instated during the 1990 growing period.

The first steps were taken in the production of certified virus-free blueberry plants in British Columbia. Two shipments of plants from Tower View Nurseries in Michigan were shipped to Sylvan Vale Nurseries and have been established in containers. Cuttings from this plant material will be propagated during 1990. Both the incoming plant material and the plants propagated from them will be checked for virus diseases during 1990 by Dr. Bob Martin, with Agriculture Canada at Vancouver.

After an adequate number of certified mother plants have been established, large numbers of one-year-old certified plants should be made available to Canadian and foreign growers.

1. Co-operator: Dave Flood, Horticulture Technician, Agriculture and Food Centre, Abbotsford

"An automated weather station was purchased for the Agriculture and Food Centre. It will provide ministry research and extension personnel with precise meteorological information in conjunction with field work. Good climate data serves as the basis for year-to-year comparisons of trial results. Precise rainfall and weather monitoring is critical to current trial plots as well as new nursery systems. Weather data summaries will be completed and distributed to researchers and ministry personnel."

2. Co-operator: Bill Peters, Provincial Berry Specialist, Abbotsford

"Work was implemented to evaluate possible chemical weed control alternatives for use in bush and treefruits and to compare these with cultural controls and/or cultural plus chemical controls. Herbicides applied will be monitored from an efficacy, crop residue, applicator safety and environmental aspect. Results will be published in newsletters, at growers' meetings, in the farm press and eventually in the Production Guides."

D-275 also contributed $1,935.00 to the costs of D.A.T.E. project 286, "Video Presentation: Integrated Pest Management in B.C.'s Horticulture Industry".

DEMONSTRATION OF AGRICULTURAL TECHNOLOGY IN THE NORTH CENTRAL REGION

Project Number: 276

Supervision: Terry Dever, Regional Director, North Central Region

Co-operators: Ross Green, District Agriculturist, Fort St. John
Grant Henry, District Agriculturist, Quesnel
Allan Blair, Manager, Agriculture Programs, Fort. St. John
Peace River Bison Association
Cariboo Central Branch, B.C. Institute of Agrologists
Jennifer O'Halloran, Field Crops Agrologist, Fort St. John
Gordon Hutton, District Agriculturist, Williams Lake
Wayne Haddow, District Agriculturist, Dawson Creek

Branch: North Central Region, Development and Extension

Funding: 1989-90 - $10,000 ($3,500)

Objectives: To enhance the adoption of new technology in the North Central Region by demonstrating new techniques and by observing, collecting and disseminating relevant information found outside the region.

Activities: Peace River Veterinarians assisted in the development and delivery of material for three beef herd health management seminars, as well as a vaccination and herd health management calendar. Dr. Heather Weaver, Tomslake; Dr. Bruce Thiesson, Fort St. John; and Dr. Barry Ross, Dawson Creek worked with Ross Green and Wayne Haddow in delivering this program for area beef producers. Seminars were held in January of 1989.

A Bull Selection Field Day, March 1, 1989 discussing reproductive soundness evaluation in breeding bulls was led by Dr. Doug Magnowski, Williams Lake. The seminar demonstrated criteria used by veterinarians when performing reproductive soundness evaluations. This helps producers select effective and improved herd sires. The field day was held at the Fred Magnussen Ranch.

Freshwater aquaculture in central and northern B.C. was the subject of a producer and profession upgrading seminar held in Prince George, February 20, 1989. Bernie Lehman, Aquaculturist from Mission, B.C. was the guest expert. The session was partly sponsored by the Cariboo Central Branch of the B.C. Institute of Agrologists.

A Grains and Oilseeds Marketing course, utilizing and demonstrating "FuturSim" software for Peace River producers was conducted by Tim Woolley in Fort St. John in March of 1989. Producers were able to employ marketing strategies using "futures" and chart their relative successes in decision-making.

Deborah Butler provided written coverage of a beef cattle handling facilities seminar. Professionally prepared articles with good pictures were used to magnify the impact of a technology demonstration field day. This coverage also added to Ministry profile and marketing of Ministry extension programs and events.

Dr. Ken Throlsen spoke to the Peace River Bison Association on Bison Health and Management in June of 1989. This seminar was held at the annual Peace River Bison producers field day.

The North Cariboo Community Futures produced a flyer listing "direct market" outlets. Copies of the promotional material went to households on a postal walk and served to enhance the profile of and assist the development of directly marketed agricultural products. The flyer was distributed during the summer of 1989 in Quesnel.

DEMONSTRATION OF AGRICULTURAL TECHNOLOGY IN THE SOUTHERN INTERIOR REGION

Helmut Arndt and Peter Waterman in Slender Spindle Multiple Row Orchard in Holland

Project Number: 277

Supervision: Brian Baehr, Regional Director, Southern Interior

Co-operators: Helmut Arndt, District Horticulturist, Kelowna;
Peter Waterman, District Horticulturist, Penticton;
Tim Watson, District Horticulturist, Oliver;
B.C.F.G.A. - Test Orchard;
Soils and Engineering Branch

Branch: Southern Interior Region - Development and Extension

Funding: D.A.T.E. 1989-90 $10,000
Southern Interior Region $4,000

Objectives: To enhance the adaption of new technologies in the Southern Interior Region by demonstrating new techniques and collecting relevant technologies from outside the region.

Summary:

Two Ministry Horticulturists travelled to Northern Europe to investigate new varieties of apples and tree nursery technology of relevance to the interior tree fruit producing areas. Based on the visit, recommendations have been made to evaluate different strains of a few of the most promising varieties and ensure increased commitment to the virus free budwood program for production of nursery stock.

High quality well feathered young trees are critical to the success of orchard renovation and the early production needed to be financially sound. The visits made reinforced the need to establish guidelines and standards for nursery trees and rootstocks.

The production systems for high density production continue to evolve and while the industry in British Columbia is headed in the right direction there are many new concepts to understand, evaluate, and demonstrate under local growing conditions.

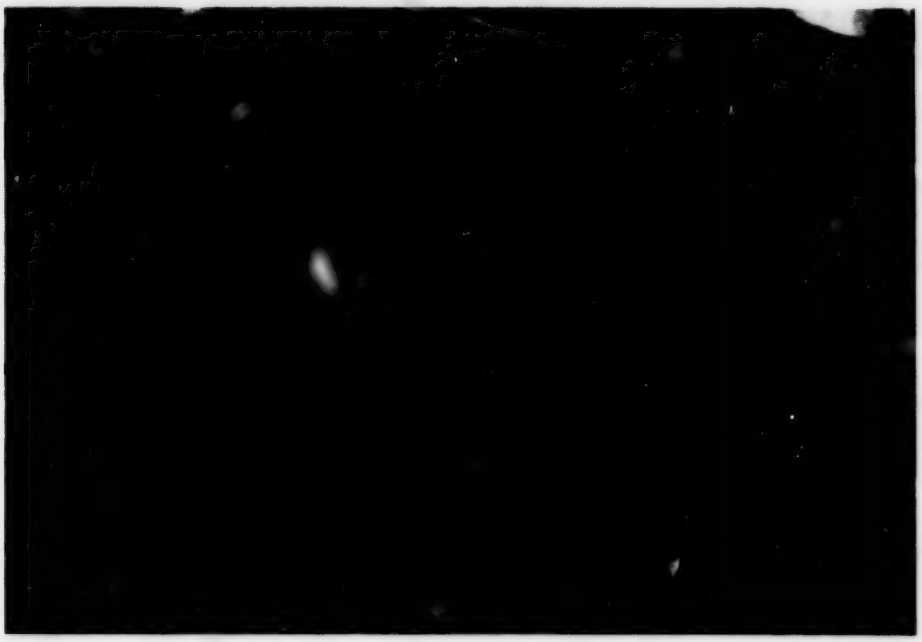
Presentations on the trip have been made to Ministry staff, industry fieldmen and at several grower meetings.

Demonstration work continued on the development of solar energy systems for livestock watering sites in remote areas. In 1989 a system was operated that was capable of watering 35 beef cows with calves and a 2 panel tracking system installed to determine the efficiency gains by having the panels automatically orient themselves to absorb the greatest amount of solar energy.

The water system performed well and the tracking option added an additional 30-40% output on sunny days. Basic pumping system costs of $1350 are reasonable for producers to consider, however the economics of the tracking option has yet to be evaluated. Both systems were demonstrated at a producer field day held in September.

A peach and nectarine planting was established in 1989 at the B.C.F.G.A. Test Orchard site in Oliver. There are 2 replications of 18 tree plots of Glohaven peaches and Redgold nectarines trained to 4 systems. Modified central leader, French axe, pillar or spindle and free standing Tatura training systems will be evaluated to determine their suitability for high density peach and nectarine plantings. Initial training of the trees was carried at planting. An important part of the establishment of the training systems will take place in 1990. An initial, small yield is expected in 1990.

RECOVERY AND RECIRCULATION OF DRAINAGE WATER FROM CUT FLOWER PRODUCTION



Concrete Catchment Basin for the Cut Flower Recirculating System.

Project Number: 280

Supervision: Gordon Grant, Provincial Floriculture Specialist, Abbotsford

Branch: Development and Extension, South Coastal Region

Funding: D.A.T.E. 1989/90 - $7,620

Objectives: 1) To provide growers with an objective assessment of recirculating technology for cut flower production.

2) To develop management guidelines for utilizing recirculation technology in greenhouse cut flower production.

Summary:

As of December 15, 1989, initial work on installing recirculating equipment will have been completed.

A concrete floor and catchment system was built to collect fertilizer waste water. One system is equipped with a U.V. sterilizing system.

Sixteen varieties of cut Lisianthus are under propagation and will run as a side by side comparison in sterilized and non sterilized rockwool system.

It is anticipated that collection of nutritional data will commence February, 1990, and yield data will commence with the first cuts in the spring of 1990.

CARIBOO REGION
FARM BUSINESS MANAGEMENT PROJECT

Project Sign - Springfield Cattle Company

Project Number: **281**

Supervision: G. Hutton, D.A. Williams Lake
G. Henry, D.A. Quesnel

Co-operators: Springfield Cattle Co., Soda Creek; Fraser River Ranching, Soda Creek; Dunlevy Ranch, Soda Creek; Ross Fredell, McLeese Lake; Rocky Point Ranch, Margurite; Ken Cameron, Quesnel River Valley; Gardner Farms, Quesnel River Valley; Doug Hatfield, Strathnaver.

Branches: Regional Extension Service, North Central Region

Funding: D.A.T.E. 1989 $11,500.

Objectives: 1) To encourage widespread adoption of sound farm management practices which will have a direct impact on net farm income in the Cariboo region.

2) To develop gross margin information factsheets on all major crops grown in the Cariboo region.

3) To provide farmers with basic production, marketing and financial planning information on these crops.

4) To provide a mechanism for discussion between farmers and staff on production and financial decisions.

Method:

Eight producers whose farms are located in site specific geographic and climatic areas in the Cariboo were chosen to participate in the project. The producers were asked to monitor their crop production practices throughout the season starting with tillage, seeding and fertilization and ending with harvest. Hours taken to complete each operation and the implement used was recorded along with type, rates and costs of seed, fertilizer and pesticides. This information was then processed on gross margin factsheets to determine the gross margin of each crop studied.

Nitrogen fertilizer inputs above those practiced by the producers were applied in strips on each crop. Samples were then taken to determine any differences in yield and nutritional value that may have occurred due to the increased rates.

Plots of different cereal varieties were established on several of the farms for varietal and cost comparison. Those varieties were as follows:

Wheat - Katepwa, Max, Oslo, HY-320
Oats - Jasper, Cascade, Calibre
Samples were also taken here to determine yields and nutritional value.

On-farm producer field days were held throughout the summer to keep the farming public informed in areas of physical crop production and improved business management techniques.

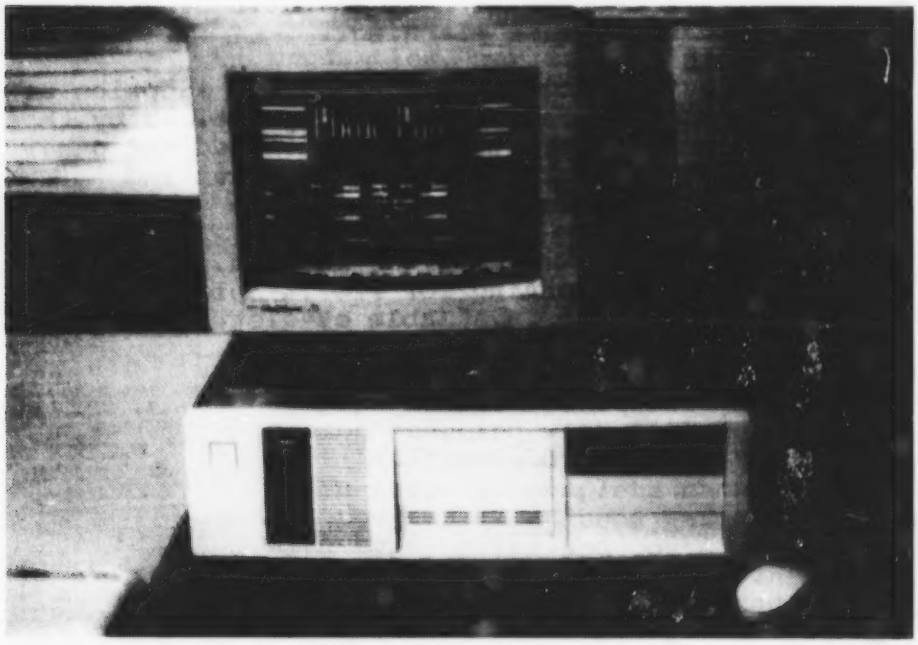
Summary:

Fifteen Gross Margin factsheets were published on the major crops grown in the Cariboo Region. They are available to producers to help in their own farm enterprise planning.

The project encouraged the adoption of sound farm management practices by those producers that were involved and other producers through field days and advertisements.

For detailed Gross Margins, please refer to "Planning for Profit" planning packages available at district offices.

B.C.M.A.F. RAPID INFORMATION NETWORK



Responding to Grower Electronic Mail on the Rapid Information Network

Project Number: 282

Supervision: Gordon Grant, Provincial Floriculture Specialist, Abbotsford, B.C.

Branch: Development and Extension, South Coastal Region

Funding: D.A.T.E. 1989-1990 - $7,900

Objectives: 1) To provide growers with electronic access to Ministry Specialist information on a 24 hour basis.

2) To establish an electronic bulletin board system at the Agriculture and Food Centre, Abbotsford, where regional offices will have ready access to the expertise of the Provincial Floriculture, Greenhouse Vegetable and Nursery Crops Specialists.

SUMMARY:

Equipment for the project was obtained in May and June, 1989. The B.C.M.A.F. - R.I.N. was up and running an a 24 hour basis in July. The Bulletin Board runs on a multi-tasking computer with the capability of handling several lines at a time. One line is currently available. Baud rates of up to 9600 are supported.

The Rapid Information Network contains several distinct features:

1) Bulletins:

News Flashes - Timely updates on new pesticide regulations or changes in regulations, upcoming events and meetings and deadline dates, etc.

Pest Warnings - Seasonal information on pests and diseases to be aware of and warnings about pests on the increase.

2) Conferences:

The electronic messaging system. An electronic mail system where messages can be exchanged between growers and the Ministry specialists. Messages can be both confidential or open for all to read.

3) The Library:

A directory of files that can be downloaded by District Horticulturists and growers. These include: Crop specific Farm Business Management spreadsheets, text files of production guides, factsheets, chemical registrations and grower newsletters.

At this point in time the R.I.N. has received 157 calls and has 39 registered users from as far away as Guelph, Ontario. There are 62 files (2.4 MBYTES) available for downloading by producers.

Most callers access the system with either 1200 or 2400 baud modems. Peak calling periods are 11 A.M., 2 P.M., 4 P.M. and 9 P.M.

Although no further D.A.T.E. funding will be required after March, 1990, the Rapid Information Network will continue to operate and will be upgraded to include a fungicide database and file areas for special interest groups such as the forest tree seedling producers.

ONION LEAF BLIGHT PREDICTION SYSTEMS FOR ACCURATE TIMING OF FUNGICIDE APPLICATIONS

Bulb onions being cured in the fields - Cloverdale Produce

Project Number: 283

Supervision: D. J. Ormrod, Plant Pathologist Cloverdale

Project Staff: Susan Wahlgren, B.C. Coast Vegetable Co-operative Association

Co-operators: W. J. Odermatt, P.Ag., Fresh Vegetable Cloverdale Produce Farms, Pacific Vegetable Farms, Paul Garvin Farms and Sprangers Farms, all of Cloverdale

Branch: Crop Protection

Funding:

D.A.T.E. 1989-90	$4,000
B.C. Coast Vegetable Co-op 1989-90	$4,210

Objectives:

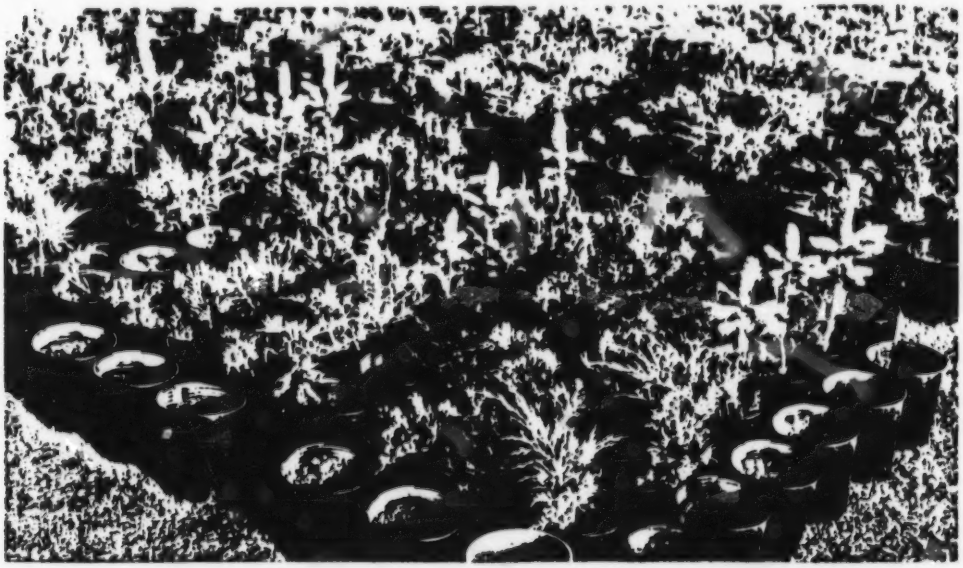
The two million dollar Cloverdale storage onion crop cannot be grown successfully without a spray program for control of the fungus diseases, leaf blight and downy mildew. Currently, growers have no clear indication when to begin a spray program. In other onion growing areas, leaf blight prediction systems have been developed to partially satisfy this need. This project was initiated at the request of the growers to evaluate these systems under local conditions.

Summary:

After thoroughly reviewing the literature and contacting research workers in Ontario, Quebec, and New York, it was decided to evaluate three systems. BOTCAST, developed in Ontario, involved monitoring temperature and relative humidity in the field and when conditions become favourable for disease, a regular spray program is started. BLIGHT-ALERT, developed in New York, utilizes both environmental data collected in the field and the farm weather forecast to schedule sprays throughout the growing season. The Critical Disease Level/Sequential Sampling Plan (CDL/SSP), also developed in New York, involves scouting the fields and counting disease lesions on the leaves to determine when to start a spray program. From then on, the BLIGHT-ALERT system is used.

During the 1989 growing season, sprays were applied as indicated by each of these systems to compare with a regular spray program started in the first week of July as currently recommended. None of these systems resulted in fewer fungicide applications or better disease control than the current recommendation. Disease conditions were severe in 1989. The systems will be evaluated again in 1990 before making a final decision on their usefulness for the Cloverdale area.

EVALUATION OF HERBICIDES SINGLY OR IN COMBINATION FOR WEED CONTROL ON CONTAINERIZED ORNAMENTAL PLANTS



Containerized ornamentals arranged in screening trial design

Project Number: **284**

Supervision: Carol Barnett, Nursery Industry Specialist, Abbotsford

Co-operators: Roy Cranston, Weed Specialist, Crop Protection Branch, Cloverdale;
Cannor Nurseries Ltd.;
Homestead Nurseries Ltd.;
W. Van Vloten Nurseries Ltd.;
Kato's Nursery;
Hybrid Nurseries Ltd.

Branch: Development and Extension, South Coastal Region

Funding: D.A.T.E. 1989/90 - $1,700

Objectives: To assess the efficacy and phytoxicity of a range of herbicides, of which most have current Canadian registration but not a minor use for containerized woody ornamentals. The following data will be collected over two growing seasons:

a) Level and duration of weed control,
b) phytoxic symptoms on the ornamental plant,
c) prevalent weed species requiring control in containers.

Summary: The trial site is located at the Agriculture and Food Centre, Abbotsford. Seven treatments which represent five herbicides used alone or in combination were applied to 7 plant types (July 19 or August 16, 1989). The plant types were spruce, mugo pine, potentilla, arborvitae, Blue Rug juniper, Prince of Whales juniper and Golden Phitzer juniper. Three more treatments will be applied and the seven treatments repeated for the 1990 growing season.

Efficacy ratings were recorded on November 20, 1989. They are as follows (mean of 6 blocks):

Treatment	Rate (a.i.)ha	Weed Control*
Choramben 4G	4.5 kg	0.5
Choramben 4G	6.5 kg	3.0
Trifluralin 5G	4.5 kg	4.8
Trifluralin 5G	7.0 kg	4.8
Diphenanid 50 WP	7.0 kg	4.4
Trifluralin 5G + Napropamide 10G	4.5 kg + 4.5 kg.	5.3
Trifluralin AK + Napropamide WP	6.0 kg + 6.0 kg	9.0**
Treated barkmulch		
Check		0

*Rating: 0=no weed control to 9=complete weed control with 7 and up being commercially acceptable (Expert Committee on Weeds Scale)

**Treated bark mulch gave excellent weed control. However, phytoxicity was evident on all species but spruce.

Prevalent weed types were noted as a major infestation of bittercress, with minor infestations of groundsel, fireweed, small-flowered fireweed and dandelion. Other broadleaf, grass and moss weed types were noted but were not prevalent throughout the trial area.

Efficacy and plant tolerance ratings will be recorded for the 1990 growing season to conclude the trial. Results of the trial will be documented in the Expert Committee on Weeds.

STUDY TOUR OF THE TWO MAJOR GINSENG (PANAX QUINQUEFOLIUM) PRODUCING AREAS IN NORTH AMERICA

Research Garden, Agriculture Canada Research Station Delhi, Ontario

Project Number: **285**

Supervisor: Al Oliver, Horticulturist, Kamloops

Branches: Development and Extension - Southern Interior Region

Funding: D.A.T.E., 1989-90 - $2412.00

Objectives: To visit the two major production areas of North American ginseng and gather information on the culture of ginseng. Aspects such as soil types, shading methods, drying methods, seed stratification, harvesting equipment, etc., would be observed.

Summary:

If a book was to be written about the ginseng industry after this tour, a good title would be "The Peculiarities of Ginseng". It was fascinating to talk to producers, buyers and suppliers and listen to the current state of affairs as well as the history of ginseng. Many contacts were made and the industry was observed on-site which is always an advantage.

Ginseng is interesting in that there are the older established growers who would like to keep the status quo of 1980 or earlier and the new growers who are open to share information and ideas. In this respect many growers shared much of what they knew and allowed the tour to see their gardens as well as the equipment they used. The research gardens at the Delhi Research Station were toured, but the research garden at Wausau, Wisconsin was not accessible at this time.

There was some concern regarding the advancement of the B.C. Ginseng industry. It was feared that the price was going to fall and the markets would become flooded with B.C. product. While there may be some reduction in price as Chai-na-ta and other B.C. growers come onstream, Wisconsin has seen an increase in growers from 100 in 1980 to 1700 at the present time. It is not felt that B.C.'s projected 125 acre harvest in 1993 is a very high percent of the total. British Columbia could, though, because of its proximity to some of the major buyers, be quite desirable as a source of root. This is only true to a point as each area produces roots that are different from others in respect to shape, color and internal content.

Ginseng production has many peculiarities not seen in other crops. The way it is grown, under shade, with straw mulch and the amount of management needed are but a few. The general trend in Ontario and Wisconsin was to wood lath shade.

With its supply of wood, B.C. may be able to make this competitive with the presently used cloth shading materials. There are some advantages to wood, the major one being, a reduction in temperature under the shade. Other advantages become apparent and will be presented to the industry.

Another area that is peculiar is the lack of research, breeding and plant selection that has been done until the last few years, when the industry started to "open up". Even now there is not much being done in many areas, with disease and weed control using up most of the research dollars.

VIDEO PRESENTATION: INTEGRATED PEST MANAGEMENT IN B.C.'s HORTICULTURE INDUSTRY

Broadcast video "Protecting Nature's Balance" aired on Knowledge Network program.

Project Number : **286**

Supervision: Marney K. James, Manager, Horticulture Programs, South Coastal Region, Cloverdale

Co-operators: Chris Crowley, Media Specialist, Faculty of Agricultural Sciences, University of British Columbia.
Dr. Bob Vernon, Entomologist, Agriculture Canada

Branch: Development and Extension, South Coastal Region

Funding:

D.A.T.E. 286	(1989) -	$5800.00
D.A.T.E. 275(G)	(1989) -	$1935.75
		$7735.75

Objective:

To educate the general public regarding the environmental and economic benefits of Integrated Pest Management (I.P.M.) in B.C.'s horticulture industry by developing a broadcast quality video "Protecting Nature's Balance" that will be featured on a Knowledge Network television program.

Summary:

The video "Protecting Nature's Balance" describes how B.C.'s horticulture industry has taken a lead position in the development and adoption of I.P.M. technology and demonstrates how farmers in British Columbia are employing these techniques to dramatically reduce the use of chemicals in crop production. This video was featured on a program on Integrated Pest Management on Knowledge Network on June 1, 1989 at 7:00 p.m. The program included a live, phone-in question period in which viewers directed comments to a panel of experts who were involved in the development and implementation of this technology. The entire program was rebroadcast on June 22, 1989 at 6:00 p.m.

The production and broadcasting of "Protecting Nature's Balance" provided an excellent opportunity for the B.C. horticulture industry to promote the advancements they have undertaken in crop management and to explain the benefits these provide to the general public and to the farming community.

The video is available for loan to individuals or organizations wishing to acquire more information on this technology.

IMPORTATION OF EXPERTISE ON THE APPLICATION OF OZONE IN THE AQUACULTURE INDUSTRIES

Project Number: 287

Supervision: Edward A. Black, Head, Aquatic Studies Unit, Aquaculture and Commercial Fisheries Branch, Victoria

Co-operators: Dr. Harald Rosenthal, Director, Aquaculture Institute, University of Kiel, Kiel, Federal Republic of Germany.

Dr. Jeff Thompson, Institute of Ocean Sciences, Fisheries and Oceans Canada, Sidney, B.C.

Branch: Aquaculture and Commercial Fisheries Branch

Funding: D.A.T.E. 1989/90 - $2,530

Objectives: To make a presentation to scientists and farmers on the use of ozone technologies in aquaculture and to confer with industry and review existing application of the technologies in B.C.

Summary: Dr. Rosenthal's talk was well received by the approximately thirty farmers and scientists present. In Europe ozone is the dominant disinfection technology and has been for decades. Further, it is a very flexible technology which can also be used in other forms of water treatment such as reduction of BOD, and iron and ammonia concentrations.

During the tour of three of B.C.'s aquaculture facilities using ozone and discussions with other members of the industry several points became apparent. First, the ozone technology present in the B.C. industry has been inappropriately installed. Second, the support industries and equipment suppliers do not have the appropriate knowledge to service or install this technology for our industry. Finally there is a need for a hands-on workshop type of course to instruct our industry on the correct application of this technology.

BIOLOGICAL CONTROL OF NEMATODES USING COVER CROPS

Sampling Apple Roots in Marigold Plot for Nematode Assessment

Project Number: 288

Supervision: John Yorston, Plant Pathologist, B.C.M.A.F., Kelowna

Project Staff: Raoul Powlowski and Linda Edwards of Integrated Crop Management Inc.

Co-operators: Dr. Thierry Vrain, Nematologist, Agriculture Canada Research Station, Summerland

Branch: Crop Protection Branch

Funding: D.A.T.E. 1989-90 $2,000

Objectives: D.A.T.E. Project 265 carried out in 1988 showed that nematode populations dropped dramatically when marigolds were grown on non-cropped land.

This information was used to establish the following objectives:

a) to test marigolds as a means of reducing nematodes in established perennial crops such as raspberry and apple;

b) to evaluate solarization using clear plastic as a means of reducing nematode populations.

Summary: Four plots were established; two in raspberries in Armstrong, one in bare ground on a ginseng farm and one in a five year old apple orchard in Oyama. Root lesion nematode populations were known to be high at all sites prior to using the crop covers.

Results in the apple planting showed a drop in nematode populations in apple roots in trees grown with a clear plastic mulch but this effect did not carry through to late autumn. Marigolds planted in a weed free strip around established apple trees did not reduce nematode populations in the soil or apple roots.

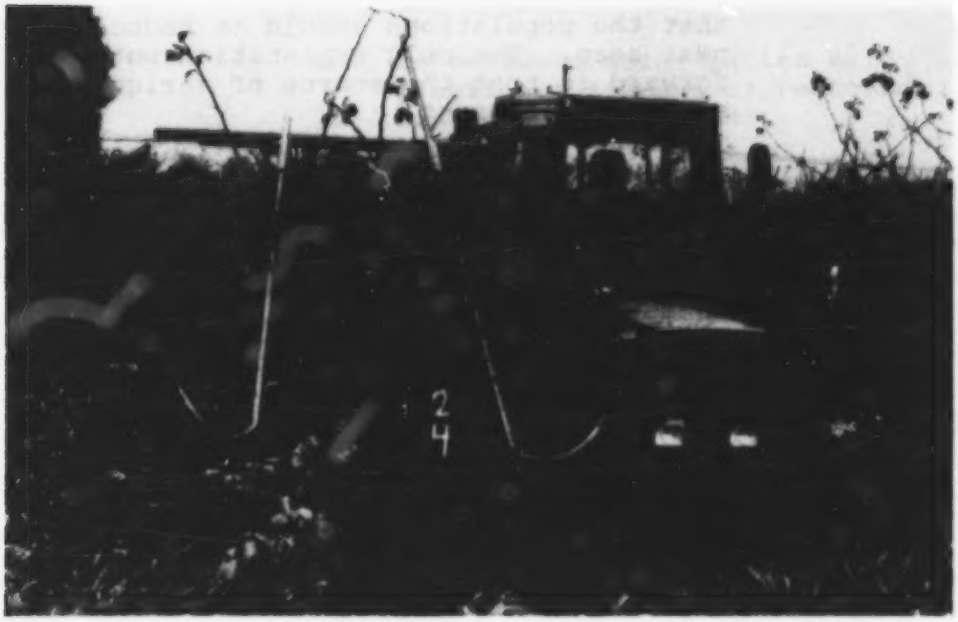
At the ginseng farm, bare land treatment were clear plastic, oats, sorghum and marigolds. Mid-season the clear plastic reduced the soil populations. By October the soil populations had increased in oats and sorghum although, as expected, the populations in sorghum roots were lower. At this site, the populations in the marigold treatment were much lower than for oats or sorghum but they were about the same as the summer fallow control.

Neither raspberry trial was successful. In one case most of the new stock planted by the grower died. In the other situation sorghum and barley were compared as post harvest cover crops between mature raspberry rows. The harvest continued much later into August than expected and proved too late for proper establishment of the cover crops.

The results from growing marigolds as a means of reducing soil nematode populations was disappointing. D.A.T.E Project 265 carried out in 1988 indicated that the populations should be reduced to near zero. The only explanation put forward is that the source of marigold seed was different.

In conclusion, it is too soon to recommend marigolds as a cover crop. Clear plastic mulch reduces the nematode populations in mid-summer under hot sunny weather but in years with dull late summer weather the populations rebound. Weed growth under clear plastic many encourage populations to increase.

RASPBERRY CANE TOPPING MACHINE



Prototype Raspberry cane topper being used to complete primary cane topping before winter.

Project Number: **289**

Supervision: Bert Van Dalfsen, Mechanical Engineer (Technical assistance by Roger G. Bryant and Erich Schulz.)

Co-operators: Sieglin Enterprises Ltd.
Bill Peters, Provincial Berry Specialist

Branch: Soils and Engineering

Funding: D.A.T.E. 1989/90 - $2000

Objectives: To design and fabricate a raspberry cane topping machine that will provide a clean cut as well as remove waste material from the row and drop it between the rows.

Summary:

Approximately 6,000 acres are dedicated to raspberry production in the lower Fraser Valley. Conventional topping by hand is very labour intensive. The sickle bar toppers have been used; however, they do not give a clean cut and, furthermore, all waste material drops into the bushes requiring hand removal at a later date. Significant labour savings can be realized with a new topper which will cut and remove cane tops.

A European manufactured grapevine trimming bar was purchased and mounted on a three-dimensionally adjustable support structure. Various cutting angles were tested to determine a permanent setting. Future designs will incorporate a cutter bar that is fixed in two dimensions and retains vertical adjustment to vary cutting heights. A hydraulic cylinder within a simple slide assembly provides easy on-the-go vertical adjustment.

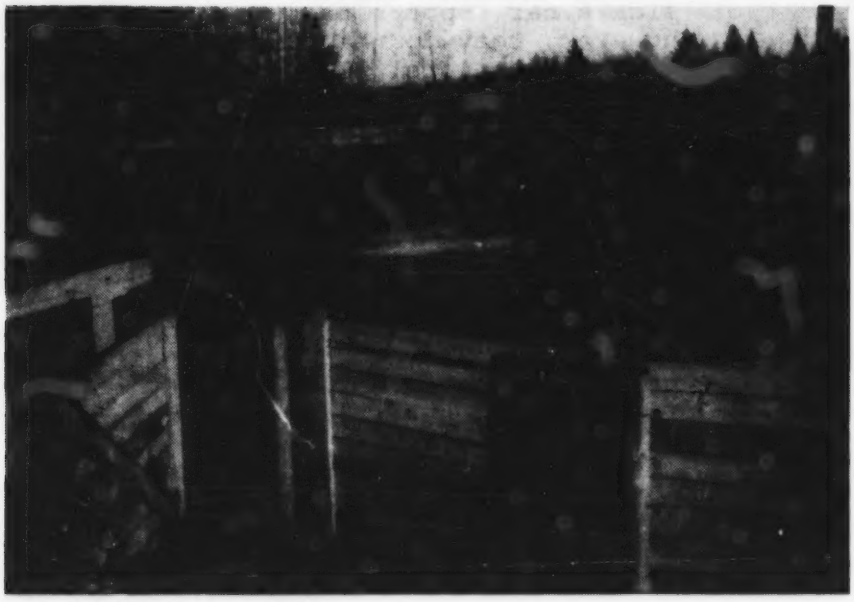
Adjustable gathering tines were also designed. After considerable testing, it was determined that a simplified version would do an adequate job of feeding stray canes into the cutting mechanism.

The cutting mechanism consists of a hydraulic motor that turns a belt with attached cutting knives. These knives slide across stator teeth. The belt is driven at high speed and this provides an excellent cutting action. At the proper ground speed clean cuts are achieved. The speed of the knives also provide adequate momentum to most of the cut canes to throw these between the rows.

Preliminary winter topping has been tested to date. Further tests will be conducted when the vines have been thinned and tied in small bunches.

The machine will be demonstrated at various field days and displayed at various meetings. A complete set of drawings will be made available once final testing has been completed.

DEMONSTRATION OF IMPROVED CATTLE HANDLING FACILITY IN THE PEACE RIVER



Project Number: 290

Supervision: Murray Tenove, Agricultural Engineer, Dawson Creek

Co-operators: Tom Ostero, purebred rancher, Taylor

Branches: Soils and Engineering Branch
Development and Extension Branch, North/Central Region

Funding: D.A.T.E. 1989-90 $1,000

Objectives: To demonstrate how to physically layout and construct an improved, low-cost, adaptable cattle handling facility that uses up-to-date knowledge of animal behavior understanding and practical construction techniques appropriate for the Peace River region. To have such a facility available to Ministry staff and Peace country rancher for future extension efforts on this, and related topics.

Summary:

Ministry staff have agreed that one of the major obstacles to ranchers carrying out improved management practices (like the CIP pocketbook program) is the inability to easily handle their cattle and observe performance. Information on the theory of animal behaviour and the design of improved cattle handling facilities, from researchers like Temple Grandin, has been fairly well presented over the last few years. The full adoption of this state of the art technology has been slow, due to problems in laying out the design and adapting it to locally available construction materials. An improved, adaptable plan and layout procedure has been developed by Trevor Jones of Alberta Agriculture, which solves many of the problems experienced in handling cattle.

A centrally located, progressive rancher was found to aid us in our efforts to extend this information and instruct the 40 plus attendants on how to layout a handling facility and construct a few key structural features. Later in October, another field tour was held in conjunction with Beef Backgrounding seminar for 40 plus ranchers to view the completed facility.

The construction costs were approximately $3500 for materials plus approximately 200 hours of labour. The cooperating rancher purchased or supplied most of the materials plus the labor to construct the facility on his ranch near Taylor.

Future access for viewing this facility by the agricultural community and B.C. Ministry of Agriculture staff can be arranged. As well, future extension efforts on this and related topics may utilize this facility. Plans and information are available through Soils and Engineering Branch.